

Company: San Diego Gas & Electric Company (U 902 M)  
Proceeding: 2024 General Rate Case  
Application: [A.22-05-015/-016 \(cons.\)](#)  
Exhibit: [SDG&E-14-E](#)

**PREPARED DIRECT TESTIMONY OF**  
**DANIEL S. BAERMAN**  
**(ELECTRIC GENERATION)**

**ERRATA**

**BEFORE THE PUBLIC UTILITIES COMMISSION**  
**OF THE STATE OF CALIFORNIA**



May 202~~3~~<sup>2</sup>

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**SUMMARY**

<b>ELECTRIC GENERATION (In 2021 \$)</b>			
	<b>2021 Adjusted-Recorded (000s)</b>	<b>TY2024 Estimated (000s)</b>	<b>Change (000s)</b>
Total Non-Shared Services	36,576	40,809	4,233
<b>Total O&amp;M</b>	<b>36,576</b>	<b>40,809</b>	<b>4,233</b>

<b>ELECTRIC GENERATION (In 2021 \$)</b>				
	<b>2021 Adjusted-Recorded (000s)</b>	<b>Estimated 2022 (000s)</b>	<b>Estimated 2023 (000s)</b>	<b>Estimated 2024 (000s)</b>
<b>Total CAPITAL</b>	<b>43,625</b>	<b>37,37588</b>	<b>45,40619</b>	<b>43,85467</b>

**Summary of Requests**

- SDG&E’s Electric Generation fleet consists of the Palomar Energy Center (PEC), Desert Star Energy Center (DSEC), Miramar Energy Facility (MEF), and Cuyamaca Peak Energy Plant (CPEP). I describe each of these plants and their forecasted costs in greater detail in my testimony.
- SDG&E’s current Electric Generation Distributed Energy Facilities (DEF) fleet consists of the Escondido Battery Energy Storage System (Escondido BESS), El Cajon Battery Energy Storage System (El Cajon BESS), the Ramona Solar Energy Project (RSEP), Miguel Vanadium Redox Flow (VRF) BESS, and the Top Gun BESS. I describe each of these DEF and their forecasted costs in greater detail in my testimony.
- New Distributed Energy Facilities (DEF) will be added to the Electric Generation fleet in 2022 and 2023. Additional employees are included in the forecast for 2022 to support the expansion of the SDG&E fleet. I describe each of these DEF and their forecasted costs in greater detail in my testimony. These facilities are:
  - Scheduled for 2022 and 2023
    - Borrego Springs Microgrid
    - Butterfield Ranch Microgrid
    - Cameron Corners Microgrid

- Fallbrook BESS
- Kearny BESS
- Melrose BESS
- Pala-Gomez Creek BESS
- Ramona Microgrid
- Ramona Solar
- Shelter Valley Microgrid
- Westside Canal BESS

**PREPARED DIRECT TESTIMONY OF  
DANIEL S. BAERMAN  
(ELECTRIC GENERATION)**

**I. INTRODUCTION**

**A. Summary of Electric Generation Costs and Activities**

My testimony supports the Test Year 2024 forecasts for operations and maintenance (O&M) costs for non-shared services, and capital costs for the forecast years 2022, 2023, and 2024, associated with the electric Generation area for SDG&E. This testimony covers Generation Plant, Distributed Energy Facilities and Administration. Table DSB-1 below summarizes my sponsored costs. San Onofre Nuclear Generating Station (SONGS) costs that were previously requested in SDG&E’s Electric Generation Chapter in the TY 2019 General Rate Case (GRC) are now being requested in the Environmental Services and SONGS Chapter because the SONGS and Environmental Services departments are in the same organizational division whereas in the prior GRC, they were organized in separate divisions; additionally, since SONGS is in decommissioning, it should no longer be placed in this Electric Generation Chapter.

**TABLE DSB-1  
Test Year 2024 Summary of Total Costs**

<b>ELECTRIC GENERATION (In 2021 \$)</b>			
	<b>2021 Adjusted-Recorded (000s)</b>	<b>TY2024 Estimated (000s)</b>	<b>Change (000s)</b>
Total Non-Shared Services	36,576	40,787	4,211
<b>Total O&amp;M</b>	<b>36,576</b>	<b>40,787</b>	<b>4,211</b>

<b>ELECTRIC GENERATION (In 2021 \$)</b>				
	<b>2021 Adjusted-Recorded (000s)</b>	<b>Estimated 2022 (000s)</b>	<b>Estimated 2023 (000s)</b>	<b>Estimated 2024 (000s)</b>
<b>Total CAPITAL</b>	<b>43,625</b>	<b>37,375<del>88</del></b>	<b>45,406<del>19</del></b>	<b>43,854<del>67</del></b>

Electric Generation is responsible for the safe and reliable operation and maintenance of the Generation Plant and Distributed Energy Facilities. Costs are included for new distributed energy facilities including additional employees to support these assets. Also, costs are included for cybersecurity and atypical and special power plant projects.

1           **B.     Support To and From Other Witnesses**

2           My testimony also references the testimony and workpapers of several other witnesses,  
3 either in support of their testimony or as referential support for mine. Those witnesses are the  
4 following:

- 5           •     Fernando Valero’s Clean Energy Innovations testimony (Exhibit (Ex.) SDG&E-  
6           15). See references to Palomar Hydrogen Systems and Hybrid at Miramar Energy  
7           Facility.
- 8           •     Jonathan Woldemariam’s Wildfire Mitigation and Vegetation Management  
9           testimony (Ex. SDG&E-13). See references to the Wildfire Mitigation Plan.
- 10          •     Arthur Alvarez’s Fleet Services testimony (Ex. SDG&E-22).

11          **C.     Organization of Testimony**

12          My testimony is organized as follows:

- 13          •     Introduction
- 14          •     Sustainability and Safety Culture
- 15          •     Non-Shared Costs
- 16          •     Capital
- 17          •     Conclusion
- 18          •     Witness Qualifications.

19          **D.     Description of Electric Generation Facilities**

20               **1.     Generation Plants**

21                   **a.     Generation Plant Palomar**

22           The Palomar Energy Center (PEC) is a 588 megawatt gas-fired combined-cycle plant  
23 with 2 GE 7FA model combustion turbines and a GE steam turbine. The plant is equipped with  
24 inlet-air chillers and a thermal energy storage tank that allows the plant to produce energy at its  
25 capacity during the summer months. Recycled water is used for cooling plant equipment.

1                                   **b.       Generation Plant Desert Star**

2                   The Desert Star Energy Center<sup>1</sup> (DSEC), located in Boulder City, NV, is a 480 megawatt  
3 gas-fired combined-cycle plant with 2 Siemens 501-FC model combustion turbines and a  
4 Westinghouse steam turbine. This plant was acquired by SDG&E in October 2011 pursuant to  
5 D.07-11-046. This Decision permitted SDG&E to exercise an option to purchase the facility  
6 from El Dorado Energy, LLC, a subsidiary of Sempra Energy.

7                                   **c.       Generation Plant Miramar**

8                   The Miramar Energy Facility (MEF) is a peaking plant with two GE LM6000 model  
9 turbines that together produce 92 megawatts (MEF-1 and MEF-2). This site also provides black  
10 start services used for restoration of the electric grid. Operations and maintenance personnel  
11 based out of the Palomar Energy Center provide all plant services to this facility.

12                                   **d.       Generation Plant Cuyamaca**

13                   The Cuyamaca Peak Energy Plant (CPEP) is a peaking plant with a Pratt & Whitney FT8  
14 model turbine generator set that produces 45 megawatts. This site also provides black start  
15 services used for restoration of the electric grid. Operations and maintenance personnel based  
16 out of the Palomar Energy Center provide all plant services to this facility.

17                                   **2.       Distributed Energy Facilities - Current**

18                                   **a.       Escondido Battery Energy Storage System**

19                   The Escondido Battery Energy Storage System (BESS) is a 120 megawatt-hour energy  
20 storage system with a maximum output of 30 megawatts for up to 4 hours. The energy storage  
21 system uses lithium-ion batteries. The project construction began Q4/2016 and began to operate  
22 commercially Q1/2017. Pursuant to California Public Utilities Commission (CPUC or  
23 Commission) Resolution E-4791 on May 26, 2016,<sup>2</sup> SDG&E developed expedited energy  
24 storage projects to alleviate reliability issues associated with Aliso Canyon. CPUC approval was  
25 requested via Tier 3 Advice Letter 2924-E. The Advice Letter was approved in its entirety in

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<sup>1</sup> The current lease agreement expires in 2027, but SDG&E is exploring a potential lease extension, along with alternatives to convert the plant to a clean dispatchable resource. If these initiatives move forward, additional filings would be made in the future to seek applicable regulatory approvals.

<sup>2</sup> Resolution Authorizing Expedited Procurement of Storage Resources to Ensure Electric Reliability in the Los Angeles Basin due to Limited Operations of the Aliso Canyon Storage Facility), issued May 31, 2016. Available at: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M162/K850/162850315.PDF>.



1 CPUC Resolution E-4798 on August 24, 2016, and effective on August 18, 2016. Operations  
2 and maintenance personnel based out of the Palomar Energy Center provide all plant services to  
3 this facility.

4 **b. El Cajon Battery Energy Storage System**

5 The El Cajon BESS was developed and constructed under the same authorization as the  
6 Escondido battery project and uses lithium-ion technology for the energy storage system. This  
7 energy storage system is rated at 30 megawatt-hours with a maximum output of 7.5 megawatts  
8 for up to 4 hours. Operations and maintenance personnel based out of the Palomar Energy  
9 Center provide all plant services to this facility.

10 **c. Kearny BESS**

11 The Kearny BESS was developed and constructed as part of SDG&E's Integrated  
12 Resource Plan. This energy storage system uses two lithium-ion battery systems each rated at 40  
13 megawatt-hours with a maximum output of 10 megawatts for up to 4 hours. The combination  
14 provides a total of 80 megawatt-hours with a maximum output of 20 megawatts for up to 4  
15 hours. Operations and maintenance personnel based out of the Palomar Energy Center provide  
16 all plant services to this facility.

17 **d. Miguel Vanadium Redox Flow BESS**

18 The Miguel Vanadium Redox Flow (VRF) BESS was constructed as a demonstration  
19 project in partnership with Sumitomo, Japan's New Energy and Industrial Technology  
20 Development Organization (NEDO) and GO-Biz and uses flow technology. This energy storage  
21 system is rated at 8 megawatt-hours with a maximum output of 2 megawatts for up to 4 hours.  
22 Operations and maintenance personnel based out of the Palomar Energy Center provide all plant  
23 services to this facility.

24 **e. Ramona Solar Energy Project (RSEP)**

25 The Ramona Solar Energy Project was developed and constructed pursuant to D.10-09-  
26 016 and SDG&E's Advice Letter 2374-E-A, approved August 23, 2012 and effective August 5,  
27 2012. The project is built with fixed photovoltaic panels and can produce up to 4.32 megawatts.  
28 Operations and maintenance personnel based out of the Palomar Energy Center provide all plant  
29 services to this facility.

1 **f. Top Gun BESS**

2 The Top Gun BESS was constructed pursuant to Assembly Bill (AB) 2514 and uses  
3 lithium-ion battery technology energy storage.<sup>3</sup> This energy storage system is rated at 120  
4 megawatt-hours with a maximum output of 30 megawatts for up to 4 hours. Operations and  
5 maintenance personnel based out of the Palomar Energy Center provide all plant services to this  
6 facility.

7 **3. Distributed Energy Facilities – Scheduled for 2022 and 2023**

8 **a. Borrego Springs Microgrid**

9 The Borrego Microgrid was constructed by the SDG&E Advanced Clean Technology  
10 department. It uses a combination of technologies to support the microgrid: a lithium-ion BESS  
11 rated at 13.6 megawatt-hours with a maximum output of 6.7 megawatts for 2 hours and a 1  
12 megawatt hydrogen electrolyzer to produce fuel for over 8 hours of output via a 250 kilowatt fuel  
13 cell to supply a local 12 kilovolt distribution circuit serving the desert community of Borrego  
14 Springs. Operations and maintenance personnel based out of the Palomar Energy Center provide  
15 all plant services to this facility.

16 **b. Butterfield Ranch Microgrid**

17 The Butterfield Ranch Microgrid will be constructed to support the Wildfire Mitigation  
18 Program. The site combines a lithium-ion BESS rated at 2.5 megawatt-hours with a maximum  
19 output of 600 kilowatts and a 650 kilowatts (alternating current) solar power plant. Operations  
20 and maintenance personnel based out of the Palomar Energy Center will provide all plant  
21 services to this facility.

22 **c. Cameron Corners Microgrid**

23 The Cameron Corners Microgrid was constructed to support the Wildfire Mitigation  
24 Program. The site combines an Iron Flow BESS rated at 2.4 MWh with a maximum output of  
25 540 kilowatts and an 875 kilowatts (alternating current) solar power plant. Operations and

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<sup>3</sup> AB 2514 (Skinner, Chapter 469, Statutes of 2010), amended by Assembly Bill 2227 (Bradford, Chapter 606, Statutes of 2012), was designed to encourage California to incorporate energy storage into the electricity grid, as codified at Public Utilities Code § 2835-2839 and § 9506. Energy storage can provide a multitude of benefits to California, including supporting the integration of greater amounts of renewable energy into the electric grid, deferring the need for new fossil-fueled power plants and transmission and distribution infrastructure, and reducing dependence on fossil fuel generation to meet peak loads.

1 maintenance personnel based out of the Palomar Energy Center provide all plant services to this  
2 facility.

3 **d. Fallbrook BESS**

4 The Fallbrook BESS will be constructed pursuant to AB 2514 and uses lithium-ion  
5 technology.<sup>4</sup> This energy storage system is rated at 160 megawatt-hours with a maximum output  
6 of 40 megawatts for up to 4 hours. Operations and maintenance personnel based out of the  
7 Palomar Energy Center will provide all plant services to this facility.

8 **e. Melrose BESS**

9 The Melrose BESS will be constructed to support the Emergency Reliability Order  
10 Instituting Rulemaking (OIR) R.20-11-003. The energy storage system uses two lithium-ion  
11 batteries each rated at 40 megawatt-hours with a maximum output of 10 megawatts. The  
12 combination provides a total of 80 megawatt-hours with a maximum output of 20 megawatts.  
13 Operations and maintenance personnel based out of the Palomar Energy Center will provide all  
14 plant services to this facility.

15 **f. Pala-Gomez Creek BESS**

16 The Pala-Gomez Creek BESS will be constructed to support the Emergency Reliability  
17 OIR R.20-11-003. The energy storage system uses lithium-ion technology and is rated at 60  
18 megawatt-hours with a maximum output of 10 megawatts for up to 6 hours. Operations and  
19 maintenance personnel based out of the Palomar Energy Center will provide all plant services to  
20 this facility.

21 **g. Ramona Microgrid**

22 The Ramona Microgrid was constructed to support the Wildfire Mitigation Program. The  
23 site uses lithium-ion technology rated at 2 megawatt-hours with a maximum output of 500  
24 kilowatts. Operations and maintenance personnel based out of the Palomar Energy Center  
25 provide all plant services to this facility.

26 **h. Shelter Valley Microgrid**

27 The Shelter Valley Microgrid will be constructed to support the Wildfire Mitigation  
28 Program. The site combines a lithium-ion battery rated at 3.25 megawatt-hours with a maximum  
29 output of 700 kilowatts and an 800 kilowatt (alternating current) solar power plant. Operations

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<sup>4</sup> *Id.*

1 and maintenance personnel based out of the Palomar Energy Center will provide all plant  
2 services to this facility.

3 **i. Westside Canal**

4 The Westside Canal BESS will be constructed to support the Emergency Reliability OIR  
5 R.20-11-003. This energy storage system uses lithium-ion technology and is rated at 528  
6 megawatt-hours with a maximum output of 132 megawatts for up to four hours. Operations and  
7 maintenance personnel based out of the Palomar Energy Center will provide all plant services to  
8 this facility.

9 **4. Administration**

10 Generation Plant Administration provides managerial oversight and analytical support for  
11 the generating fleet.

12 **II. SUSTAINABILITY AND SAFETY CULTURE**

13 Sustainability, safety, and reliability are the cornerstones of SDG&E’s core business  
14 operations and are central to SDG&E’s GRC presentation. SDG&E is committed to not only  
15 deliver clean, safe, and reliable electric and natural gas service, but to do so in a manner that  
16 supports California’s climate policy, adaptation, and mitigation efforts. In support of the legal  
17 and regulatory framework set by the state, SDG&E has set a goal to reach Net Zero greenhouse  
18 gas (GHG) emissions by 2045, adopted a Sustainability Strategy to facilitate the integration of  
19 GHG emission reduction strategies into SDG&E’s day-to-day operations and long-term  
20 planning, and published an economy-wide GHG Study that recommends a diverse approach for  
21 California leveraging clean electricity, clean fuels, and carbon removal to achieve the 2045 goals  
22 through the lens of reliability, affordability, and equity. The Sustainability Strategy serves as  
23 SDG&E’s guide to enable a more just and equitable energy future in SDG&E’s service territory  
24 and beyond. As a “living” strategy, SDG&E will continue to update the goals and objectives as  
25 technologies, policies, and stakeholder preferences change. See the Sustainability Policy  
26 testimony of Estela de Llanos (Ex. SDG&E-02).

27 In this GRC, SDG&E focuses on three major categories that underpin the Sustainability  
28 Strategy: mitigating climate change, adapting to climate change, and transforming the grid to be  
29 the reliable and resilient catalyst for clean energy. SDG&E's goal is to contribute to the  
30 decarbonization of the economy by way of diversifying energy resources, collaborating with

1 regional partners, and providing customer choice that enables an affordable, flexible, and  
2 resilient grid.

3 Many of the activities described in further detail in this testimony advance the state's  
4 climate goals and align with SDG&E's Sustainability Strategy. Specifically, the proposed DEF  
5 projects will drive progress in the areas of Climate Adaptation, Climate Mitigation and/or Grid  
6 Transformation.

7 Safety is a core value and SDG&E is committed to providing safe and reliable service to  
8 all its stakeholders. This safety-first culture is embedded in every aspect of the Company's work.  
9 A safety culture includes the integration of an effective risk management process and approach.  
10 SDG&E has in place, a well-structured and documented approach to risk management. Risks  
11 related to Electric Generation are generally related to safety, system reliability, physical site and  
12 cybersecurity, natural disaster, and recovery from grid outages. System reliability risks may  
13 include unexpected damage to major generating equipment that could adversely affect the plant  
14 rating or ability to produce power. Physical security risks, such as vandalism, theft, sabotage,  
15 and terrorism, may affect employee safety and plant reliability and could result in down time and  
16 costly repairs. Wildfires and earthquakes are types of risks from natural disasters.

17 As SDG&E's generation business has become more complex, the safety and security  
18 risks associated with operating the systems have also grown. These dynamics require an  
19 evolution in the Company's approach to managing risks. The integration of risks and their  
20 mitigation activities in an ever-changing environment is a way in which Electric Generation  
21 builds and maintains SDG&E's safety culture for both its employees, customers, and the  
22 communities in which SDG&E serves.

### 23 **Voluntary Protection Program - Star (VPP)**

24 Electric Generation's Voluntary Protection Program - Star (VPP) recognizes outstanding  
25 safety and health practices. Currently, DSEC maintains Nevada VPP status (since 2009) and the  
26 California plants maintain VPP status as follows: PEC since 2018, MEF since 2021 and CPEP  
27 since 2021. Successful completion of the certification and periodic recertification process  
28 indicates that the employer and employees work together to elevate the safety and health  
29 practices beyond the standard requirements. The costs include engineered improvements,  
30 additional safety equipment, and additional employee and management time in developing new  
31 practices and maintaining the elevated requirements and documentation.

1 **III. NON-SHARED COSTS**

2 “Non-Shared Services” are activities that are performed by a utility solely for its own  
 3 benefit. Corporate Center provides certain services to the utilities and to other subsidiaries. For  
 4 purposes of this general rate case, SDG&E treats costs for services received from Corporate  
 5 Center as Non-Shared Services costs, consistent with any other outside vendor costs incurred by  
 6 the utility. Table DSB-2 summarizes the total non-shared O&M forecasts for the listed cost  
 7 categories.

8 **TABLE DSB-2**  
 9 **Non-Shared O&M Summary of Costs**

<b>ELECTRIC GENERATION (In 2021 \$)</b>			
<b>Categories of Management</b>	<b>2021 Adjusted-Recorded (000s)</b>	<b>TY2024 Estimated (000s)</b>	<b>Change (000s)</b>
A. Generation Plant	36,308	40,506	4,198
B. Administration	268	303	35
<b>Total Non-Shared Services</b>	<b>36,576</b>	<b>40,809</b>	<b>4,233</b>

10  
 11 **A. Generation Plant**

12 **TABLE DSB-3**  
 13 **Generation Plant O&M**

<b>ELECTRIC GENERATION (In 2021 \$)</b>			
<b>A. Generation Plant</b>	<b>2021 Adjusted-Recorded (000s)</b>	<b>TY2024 Estimated (000s)</b>	<b>Change (000s)</b>
1. Generation Plant Palomar	19,016	20,745	1,729
2. Generation Plant Desert Star	13,769	15,112	1,343
3. Generation Plant Miramar	1,980	1,964	-16
4. Generation Plant Cuyamaca	1,114	906	-208
5. Distributed Energy Facilities	429	1,779	1,350
<b>Total</b>	<b>36,308</b>	<b>40,506</b>	<b>4,198</b>
<b>B. Administration</b>	<b>2021 Adjusted-Recorded (000s)</b>	<b>TY2024 Estimated (000s)</b>	<b>Change (000s)</b>
1. Generation Plant Administration	268	303	35
<b>Total</b>	<b>268</b>	<b>303</b>	<b>35</b>

1                   **1.       Generation Plant Palomar**

2                   **a.       Description of costs and Underlying Activities**

3                   The O&M request for Palomar as shown in Table DSB-3 includes labor and non-labor  
4 costs. The labor component includes salaries for supervision, support staff and maintenance and  
5 operations personnel. The non-labor component includes, but is not limited to, industrial gases,  
6 chemicals, water, outside services, spare parts, miscellaneous consumables, and maintenance  
7 activities. Maintenance activities are performed while the plant is operating and during planned  
8 maintenance outages.

9                   The O&M request for Palomar includes supporting a hydrogen fueling pump for  
10 hydrogen powered vehicles to provide for additional transportation needs for the DEFs. The  
11 request for those vehicles is included in the Fleet Services testimony of Arthur Alvarez(Ex.  
12 SDG&E-22).

13                   **b.       Forecast Method**

14                   Forecasting for labor and non-labor is based on a five-year average. This method was  
15 selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance  
16 outages and repairs) and unplanned but typical (e.g., steam valve damage, combustion turbine  
17 component failures, auxiliary equipment failures) maintenance events and provides a more  
18 representative history of recorded spending.

19                   **c.       Cost Drivers**

20                   Maintenance outages are a major portion of the O&M request for the Generation Plant.  
21 These outages are scheduled at least annually, with the extent of the maintenance dependent on  
22 the accumulated service hours on the equipment and the number of start-cycles the equipment  
23 experiences. Generally, more starts and more service hours result in more required maintenance.  
24 Much of the required maintenance is performed during planned outages. Planned outages are  
25 scheduled through the California Independent System Operator (CAISO).

26                   **2.       Generation Plant Desert Star**

27                   **a.       Description of Costs and Underlying Activities**

28                   The O&M request for Desert Star as shown in Table DSB-3 includes labor and non-labor  
29 costs. The labor component includes salaries for supervision, support staff and maintenance and  
30 operations personnel. The non-labor component includes, but is not limited to, industrial gases,  
31 chemicals, water, outside services, spare parts, miscellaneous consumables, and maintenance

1 activities. Maintenance activities are performed while the plant is operating, and during planned  
2 maintenance outages. The non-labor component also includes the payments for the Desert Star  
3 Long-Term Service Agreement (LTSA) purchased through Siemens. Costs related to the LTSA  
4 with Siemens for the major plant equipment are dependent on the amount of run time for the  
5 plant. LTSA costs are generally based on a dollar-per-operating-hour basis so more run time  
6 equates to higher LTSA costs. Costs for the lease payments to Boulder City on behalf of  
7 SDG&E's Desert Star Energy Center are included in Dale Tattersall's Real Estate, Land Services  
8 & Facility Operations testimony (Ex. SDG&E-23).

9 **b. Forecast Method**

10 Forecasting for labor and non-labor is based on a five-year average for O&M expenses  
11 including the LTSA. This method was selected because it allows for inclusion of a variety of  
12 planned (e.g., scheduled maintenance outages and repairs) and unplanned but typical (e.g., steam  
13 valve damage, combustion turbine component failures, auxiliary equipment failures)  
14 maintenance events and provides a more representative history of recorded spending.

15 **c. Cost Drivers**

16 Again, maintenance outages are a major portion of the O&M request for the Generation  
17 Plant. These outages are scheduled at least annually, with the extent of the maintenance  
18 dependent on the accumulated service hours on the equipment and the number of start-cycles the  
19 equipment experiences. Generally, more starts and more service hours result in more required  
20 maintenance. Much of the required maintenance is performed during planned outages. Planned  
21 outages are scheduled through the CAISO.

22 **3. Generation Plant Miramar**

23 The O&M request for Miramar as shown in Table DSB-3 includes labor and non-labor  
24 costs. The labor component includes salaries for supervision, support staff and maintenance and  
25 operations personnel. The non-labor component includes, but is not limited to, industrial gases,  
26 chemicals, water, outside services, spare parts, miscellaneous consumables, and maintenance  
27 activities. Maintenance activities are performed while the plant is operating and during planned  
28 maintenance outages.

29 **a. Forecast Method**

30 Forecasting for labor and non-labor is based on a five-year average. This method was  
31 selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance



1 outages and repairs) and unplanned but typical (e.g., combustion turbine component failures,  
2 auxiliary equipment failures) maintenance events and provides a more representative history of  
3 recorded spending.

#### 4 **b. Cost Drivers**

5 Once again, maintenance outages are a major portion of the O&M request for the  
6 Generation Plant. These outages are scheduled at least annually, with the extent of the  
7 maintenance dependent on the accumulated service hours on the equipment and the number of  
8 start-cycles the equipment experiences. Generally, more starts and more service hours result in  
9 more required maintenance. Much of the required maintenance is performed during planned  
10 outages. Planned outages are scheduled through the CAISO.

### 11 **4. Generation Plant Cuyamaca**

#### 12 **a. Description of Costs and Underlying Activities**

13 The O&M request for Cuyamaca as shown in Table DSB-3, consists of labor and non-  
14 labor costs. The labor component includes salaries for supervision, support staff and  
15 maintenance and operations personnel. The non-labor component includes, but is not limited to,  
16 industrial gases, chemicals, water, outside services, spare parts, miscellaneous consumables and  
17 maintenance activities. Maintenance activities are performed while the plant is operating and  
18 during planned maintenance outages.

#### 19 **b. Forecast Method**

20 Forecasting for labor and non-labor is based on a five-year average. This method was  
21 selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance  
22 outages and repairs) and unplanned but typical (e.g., combustion turbine component failures,  
23 auxiliary equipment failures) maintenance events and provides a more representative history of  
24 recorded spending.

#### 25 **c. Cost Drivers**

26 Maintenance outages, as with other facilities, are a major portion of the O&M request for  
27 the Generation Plant. These outages are scheduled at least annually, with the extent of the  
28 maintenance dependent on the accumulated service hours on the equipment and the number of  
29 start-cycles the equipment experiences. Generally, more starts and more service hours result in  
30 more required maintenance. Much of the required maintenance is performed during planned  
31 outages. Planned outages are scheduled through the CAISO.

1                                   **5.       Distributed Energy Facilities current and scheduled**

2       Distributed Energy Facilities, located throughout San Diego County, are the following:

- 3           •       Borrego Springs Microgrid
- 4           •       Butterfield Ranch Microgrid
- 5           •       Cameron Corners Microgrid
- 6           •       El Cajon BESS
- 7           •       Escondido BESS
- 8           •       Fallbrook BESS
- 9           •       Kearny BESS
- 10          •       Melrose BESS
- 11          •       Miguel VRF BESS
- 12          •       Pala / Gomez Creek BESS
- 13          •       Ramona Microgrid
- 14          •       Ramona Solar
- 15          •       Shelter Valley Microgrid
- 16          •       Top Gun BESS
- 17          •       Westside Canal BESS

18                                   **a.       Description of costs and Underlying Activities**

19           The O&M request for Distributed Energy Facilities as shown in Table DSB-3 consists of  
20 labor and non-labor costs. The labor component includes salaries for supervision, support staff  
21 and maintenance and operations personnel. The non-labor component includes, but is not  
22 limited to, outside services, spare parts, miscellaneous consumables and maintenance activities.  
23 Maintenance activities are performed while the plant is operating and during planned  
24 maintenance outages.

25                                   **b.       Forecast Method**

26           Forecasting for labor and non-labor is done using a base year method because the limited  
27 available historical costs are not representative of current and future costs. This method was  
28 selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance  
29 outages and repairs) and unplanned but typical maintenance events that are expected to occur at  
30 these facilities.

1 **c. Cost Drivers**

2 Maintenance outages are a significant portion of the O&M request for the distributed  
3 Energy Facilities. These outages are scheduled at least annually, with the extent of the  
4 maintenance dependent on prescribed maintenance periods and occasional unplanned outages.  
5 Much of the required maintenance is performed during planned outages. Planned outages are  
6 scheduled through the CAISO.

7 **B. Administration**

8 **1. Description of Costs**

9 The O&M request for Administration includes labor and non-labor costs. The labor  
10 component includes administrative salaries. The non-labor component includes, but is not  
11 limited to, travel, supplies, consulting, and other miscellaneous administrative activities.

12 **2. Forecast Method**

13 Forecasting for labor and non-labor is based on a 5-year average.

14 **3. Cost Drivers**

15 There is no significant change to the forecast over the 5-year average.

16 **IV. CAPITAL**

17 Table DSB-4 summarizes the total capital forecasts for 2022, 2023, and 2024.

18 **TABLE DSB-4**  
19 **Capital Expenditures Summary of Costs**

<b>ELECTRIC GENERATION (In 2021 \$)</b>				
<b>Categories of Management</b>	<b>2021 Adjusted-Recorded</b>	<b>Estimated 2022 (000s)</b>	<b>Estimated 2023 (000s)</b>	<b>Estimated 2024 (000s)</b>
A. Generation Capital	43,625	37,37588	45,40619	43,85467
<b>Total</b>	<b>43,625</b>	<b>37,37588</b>	<b>45,40619</b>	<b>43,85467</b>

20 **A. Introduction**

21 All capital projects being considered improve the overall safety, reliability and  
22 operability of the plants. Table DSB-4 summarizes the total capital forecasts for 2022, 2023, and  
23 2024.

24 In addition to this testimony, please also refer to my capital workpapers, Ex. SDG&E-14-  
25 CWP, for additional information on the activities described herein.

1 **B. Capital Projects**

2 **TABLE DSB-5**

3 **Capital Expenditures Summary of Costs**

<b>ELECTRIC GENERATION (In 2021 \$)</b>				
<b>A. Generation Capital</b>	<b>2021 Adjusted-Recorded</b>	<b>Estimated 2022(000s)</b>	<b>Estimated 2023(000s)</b>	<b>Estimated 2024(000s)</b>
1. Capital Tools & Test Equipment	50	86	86	86
2. Palomar Energy Center	8,862	19,251	18,751	8,501
3. Desert Star Energy Center	9,879	6,864	6,864	6,864
4. Miramar Energy Facility	1,008	2,201	11,300	27,853
5. Cuyamaca Peak Energy Plant	281	<del>495,508</del>	<del>495,508</del>	<del>495,508</del>
6. Ramona Solar Plant	0	55	55	55
7. Palomar Hydrogen Systems <sup>5</sup>	1,224	8,423	7,855	0
<b>Total</b>	<b>21,304</b>	<b>37,375<del>88</del></b>	<b>45,406<del>19</del></b>	<b>43,854<del>67</del></b>

4  
5 **1. Description**

6 The forecasts for 2022, 2023, and 2024 are shown in Table DSB-5 above. SDG&E does  
7 not propose a specific list of capital projects, but instead will plan, schedule, and perform capital  
8 projects, as appropriate, to best support the safe and reliable operation for Generation plants. To  
9 effectively meet this goal, SDG&E will use a general capital project budget, rather than  
10 proposing specific projects. The general capital budget allows flexibility and adaptability in  
11 capital projects to meet the current and future plant needs.

12 Projecting capital projects years in advance is difficult for a variety of reasons, such as  
13 changes in costs and technology from the time of planning to the time of implementation. Most  
14 importantly, power plant needs may change, resulting in different or unexpected priorities.  
15 Resources are then reallocated to accommodate the new priorities.

16 For example, various unplanned turbine repairs have been required in the past due to  
17 wear and tear or greater than expected start cycles. For example:

- 18 • In the 2021 PEC outage, a gas turbine annual inspection indicated that the stage  
19 17 compressor nozzles need to be replaced to safely restart the turbine. A new set  
20 of nozzles was purchased and installed.

<sup>5</sup> See Fernando Valero's Clean Energy Innovation testimony for more information on Palomar Hydrogen Systems (Ex. SDG&E-15).

- In 2020, during a periodic borescope inspection at MEF, it was determined that stage 2 high pressure turbine nozzles required replacement to continue operation. A nozzle set was purchased and installed to allow continued turbine operation.

## **2. Forecast Method**

The five-year average is used to forecast capital expenditures. The average has been adjusted by removing some large, one-time, capital projects from the history. This method is appropriate because it reflects the operational needs of the assets, through the averaging period.

## **3. Cost Drivers**

The underlying cost drivers for these capital projects relate to maintaining the clean, safe, and reliable operation of the Generation assets. Capital improvements provide for equipment upgrades to keep up with current technologies for meeting the Company goals for safety and reliability.

## **V. CONCLUSION**

This testimony describes the activities of SDG&E's Electric Generation and presents the forecast for both existing and reasonably anticipated new expenses for the GRC test year 2024. This testimony and my workpapers demonstrate the justification for the requested funding so that SDG&E can continue to meet its obligations to comply with applicable regulations and provide safe and reliable service. I request the Commission to approve funding for the expenses and projects presented here.

This concludes my prepared direct testimony.

1 **VI. WITNESS QUALIFICATIONS**

2 My name is Daniel S. Baerman. My business address is 2300 Harveson Place, Escondido,  
3 CA 92029. I am employed by SDG&E as Director – Electric Generation. I joined SDG&E in  
4 2005 and have been working in the power generation/utility industry for more than 30 years in  
5 positions of increasing responsibility. I have experience with operations and maintenance,  
6 construction management, commissioning, mobilization and plant outfitting both in the United  
7 States and abroad. I have managed 7 power plants and commissioned 13 plants of varying  
8 technologies. I am familiar with several technologies including coal-fired boilers, internal  
9 combustion reciprocating engines, aero derivative gas turbines and heavy industrial gas turbines  
10 in peaking and combined-cycle configurations.

11 I have also held the position of Director – Origination & Portfolio Design. My  
12 responsibilities included procurement of generation and other long-term supply side resources  
13 such as storage and demand response. I hold a Bachelor of Science degree in Marine  
14 Engineering from the United States Merchant Marine Academy at Kings Point, New York.

15 I have previously testified before the Commission.

## APPENDIX A – Glossary of Terms

BESS	Battery Energy Storage System
CAISO	California Independent System Operator
CPUC	California Public Utility Commission
CPEP	Cuyamaca Peak Energy Plant
DSEC	Desert Star Energy Center
GHG	Green House Gas
GRC	General Rate Case
LTSA	Long Term Service Agreement
MEF	Miramar Energy Facility
O&M	Operations and Maintenance
OIR	Order Instituting Rulemaking
PEC	Palomar Energy Center
RSEP	Ramona Solar Energy Project
SDG&E	San Diego Gas & Electric Company
VPP	Voluntary Protection Program
VRF	Vanadium Redox Flow